

Klondyke Tailings Water Quality Assurance Revolving Fund Site January 2006

The purpose of this fact sheet, a publication of the Arizona Department of Environmental Quality (ADEQ), is to inform community members near the Klondyke Tailing Water Quality Assurance Revolving Fund (WQARF) site of current site activities near the City of Safford in Graham County.

SITE HISTORY AND INVESTIGATION

The Arizona Department of Environmental Quality (ADEQ) has been conducting a *remedial investigation* at the Klondyke Tailings site to learn more about the presence of metal contaminants in the soil and groundwater. The Klondyke Tailings site was previously a *flotation mill* that, from about the 1920s to the 1970s, processed ore to recover lead, zinc, copper, silver and gold. Milling operations consisted of crushing and flotation concentration.

Mining of lead, zinc, copper, silver and gold was performed in the region from the late 1800s to the 1960s or 1970s. In 1993, ADEQ conducted a preliminary investigation of the tailings piles in Klondyke in response to a complaint regarding erosion of the tailings into the Aravaipa Creek during flooding. The Klondyke Tailings site was placed on the WQARF Registry in 1998.

The site is located approximately 4.5 miles upstream of the Aravaipa Canyon Wilderness Area, approximately 2.1 miles upstream of Stove Gulch, approximately 700 feet upstream of the Laurel Creek confluence with Aravaipa Creek and about 1.2 miles downstream from the town of Klondyke. Groundwater depth varies from 40 to 60 feet below land surface.

WHAT IS THE CURRENT SITE STATUS?

ADEQ is reviewing the results of several studies at the site. The results of these studies will be used in designing the final remedy for the site. So far, the following has been accomplished:

- Private wells in the area were sampled to help determine the impacts of the tailings on the

groundwater. No contaminants were found above regulatory levels.

- Bioavailability and mineral speciation analysis was done to determine the possible health effects of ingesting these metals.
- Color and black-and-white aerial photography, topographic mapping, historic aerial photography analysis, floodplain delineation and analysis (100, 50, 25, and 10-year) and a geomorphology study of Aravaipa Creek were done to evaluate possible remedies due to the site's location near Aravaipa Creek.
- Biological, archeological and cultural resources surveys were done in expectation that work at the site may require a 404 permit. Section 404 of the Clean Water Act prohibits the discharge of dredge or fill material into waters of the United States, including special aquatic sites such as wetlands, without a permit from the Corps of Engineers. These activities are required by the 404 permit.
- Geophysical surveys (magnetic and electromagnetic) were done to identify the presence of buried tanks or drums.
- An acid-base accounting study was done to determine if water coming in contact with the tailings would develop a low pH (acidic) due to contact with sulfur-bearing material. The low pH water may be harmful to aquatic organisms. The base accounting is a measure of the ability of a base (e.g., water or soil) to resist changes in pH.
- An early response action (ERA) alternatives analysis was done to determine if any immediate actions were necessary at the site to protect the public health or the environment.

WHAT ARE THE PLANS FOR THIS SITE?

ADEQ's immediate plans are to complete the ERA at the site. During the ERA, ADEQ will determine if

geophysical targets previously identified during the geophysical survey need to be removed. Further excavation of these targets will aid in the identification of any buried tanks, drums or pipelines requiring removal. During the ERA, a small amount of lab reagent still present at the site will be removed. Also during the ERA, ADEQ will conduct minor earth moving repairs such as repairing berms around the tailings piles and correcting drainage problems to contain stormwater runoff on the tailings piles.

ADEQ will also continue with the remedial investigation (RI) at the site. The planned activities for the RI include additional soil sampling on the entire site to determine the extent of contamination. The RI also includes sediment sampling in Aravaipa and Laurel Creek both upstream and downstream of the site. In addition, four groundwater monitor wells will be installed at the site to evaluate the impact of the tailings, if any, to the groundwater beneath the site. Once the RI is completed, a feasibility study (FS) will be conducted to determine the appropriate remedial action.

WHAT ARE THE CONTAMINANTS AT THE SITE?

The seven contaminants that are currently known to be present at levels above regulatory limits in the tailings and soil at the Klondyke Tailings site are antimony, arsenic, beryllium, cadmium, copper, lead, manganese and zinc. Unfiltered samples of shallow groundwater collected adjacent to the site have contained arsenic, beryllium, cadmium, chromium, lead and nickel above regulatory limits. Groundwater samples were collected in July 2001 from private wells that are downgradient from the site and did not contain any contaminants above regulatory limits.

WHAT ARE THE RISKS ASSOCIATED WITH THIS CONTAMINATION?

The public health assessment that the Arizona Department of Health Services completed in 2000 indicates that the site does not currently pose a health risk to nearby residents, campers, swimmers or ATV users.

If people ingest contaminated soil or water, inhale dust particles from the tailings piles, or come into contact with excessively high levels of antimony, arsenic, beryllium, cadmium, copper, lead, manganese, nickel or zinc, they could experience harmful health effects. Depending on the particular substance and

the level and route of exposure, the following health effects may occur: respiratory problems and lung damage, heart and blood vessel damage, cancer, increased risk of tumors, hypersensitivity, gastrointestinal problems, diarrhea, liver and kidney problems, and skin irritations.

WHAT IS A LOCAL COMMUNITY ADVISORY BOARD (CAB)?

A very important means for ADEQ to communicate with the public at the Klondyke Tailings site is through the Community Advisory Board (CAB). The primary purpose of the CAB is to advise ADEQ and the public of issues and concerns related to the remediation of the site. Established in June 2000, the Klondyke Tailings CAB has met regularly since its inception. The responsibilities of the CAB include:

- Participating in community outreach
- Assisting in distributing information from ADEQ to the community
- Ensuring that ADEQ understands the opinions and concerns of the residents
- Providing comments to ADEQ on various remediation techniques and other state-related issues

If you would like to apply to become a member of the Community Advisory Board or be notified of the CAB meetings, which are open to the public, please contact: Linda Mariner, Community Involvement Coordinator, at (800) 234-5677, Ext. 771-4294.

WHAT IS THE WATER QUALITY ASSURANCE REVOLVING FUND (WQARF)?

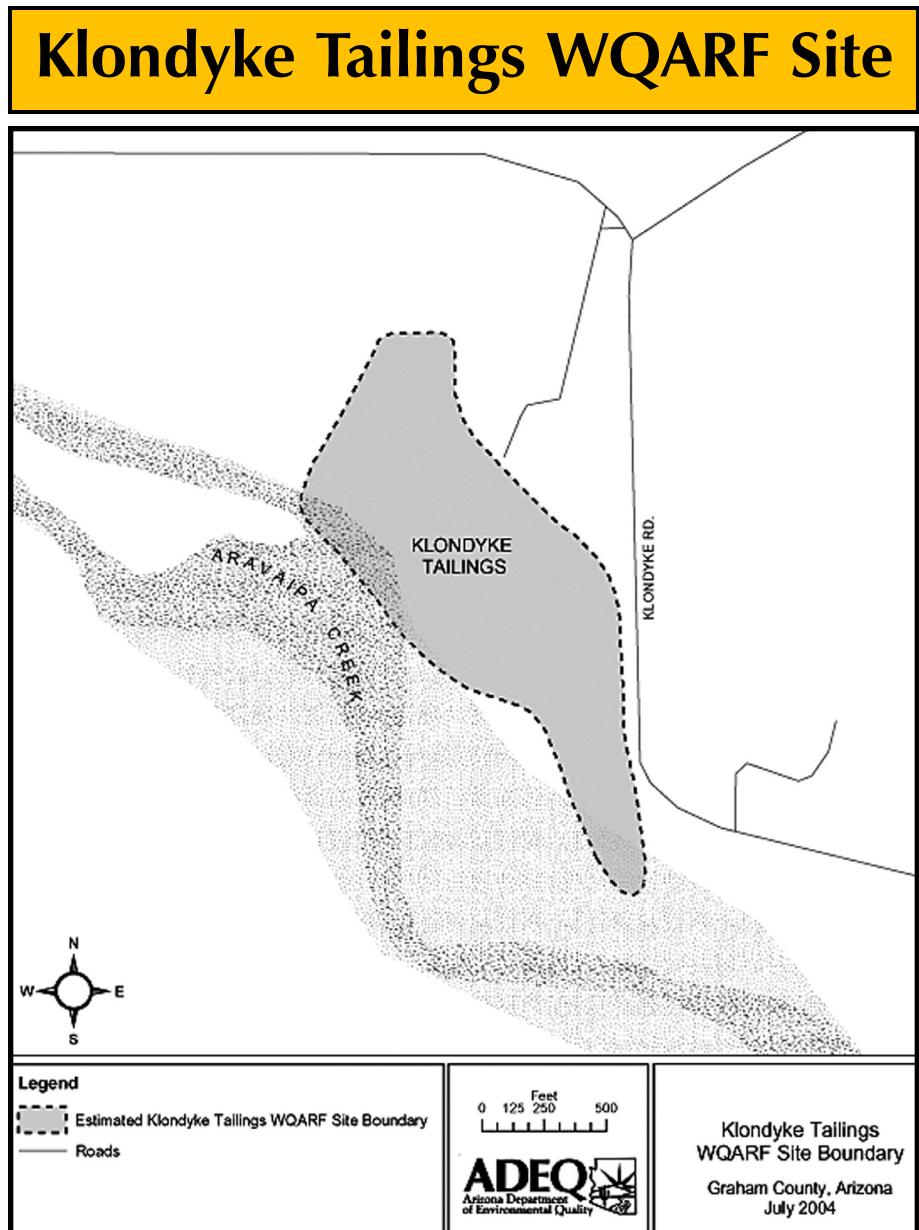
WQARF is a program established by the Arizona State Legislature to:

- 1) conduct statewide surface and groundwater monitoring;
- 2) study health effects;
- 3) perform emergency remedial actions; and
- 4) conduct long-term remedial action programs.

The WQARF program is funded with state monies, civil and criminal penalties, and funds recovered from parties responsible for contamination.

WHAT IS THE WQARF REGISTRY?

ADEQ has established a Registry of Sites in Arizona with groundwater and/or soil contamination. Sites appearing on the Registry qualify for funds available from the state's Water Quality Assurance Revolving Fund for cleanup of contamination. The Klondyke Tailings site is included on this Registry. Sites on the Registry are scored based in part upon the type of contaminants present, the location of the contaminants, and the number of people that may be affected by the contamination. Scores are used to help determine relative risk at the Site and do not necessarily mean that there is direct risk to humans or the environment. The score of the Klondyke Tailings site is 69 out of a possible 120.



ADEQ CONTACTS:

If you are interested in obtaining more information about the Klondyke Tailings site, please complete the attached mailing card, and/or contact:

Linda Mariner
ADEQ Community Involvement Coordinator
(602) 771-4294 Hearing impaired persons call
ADEQ's TDD line: (602) 771-4829
In Arizona, outside the Phoenix area, call toll free
1 (800) 234-5677, Ext. 771-4294

The project manager assigned to this site is:

Scott Goodwin
ADEQ Project Manager
(602) 771-4452
Hearing impaired persons call
ADEQ's TDD line: (602) 771-4829
In Arizona, outside the Phoenix area, call toll free
1 (800) 234-5677, Ext. 771-4452

ADEQ main offices are located at:
1110 W. Washington St., Phoenix, AZ 85007
(602) 771-2300 Fax: (602) 771-4138

For further information on this site or other WQARF sites, please visit the ADEQ website at: <http://www.azdeq.gov>. Click on Waste Programs, then click on Superfund programs. Follow the links to get to the information that you need.



Arizona Department
of Environmental Quality

Janet Napolitano, Governor
Stephen A. Owens, ADEQ Director

Linda Mariner,
Community Involvement Coordinator
1110 W. Washington Street, 4415B-1
Phoenix, AZ 85007-9973

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GLOSSARY

Bioavailability - Degree of ability to be absorbed and ready to interact in an organism's metabolism.

Contaminants - Any hazardous substance released into the environment.

Downgradient - The direction that groundwater flows; similar to "downstream" for surface water.

Early Response Action (ERA) - Clean-up activity that is performed prior to the final remedy and often prior to the completion of the remedial investigation because timeliness of response is required to protect the public health or environment.

Feasibility Study (FS) - The process of selecting the proposed remedy, which is a combination of remedial strategies and remedial measures, which as a whole, is capable of achieving the remedial objectives.

Flotation - The separating of finely crushed minerals from one another by causing some to float in a froth and others to remain in suspension. Oils and various chemicals are used to activate, make floatable, or depress the minerals.

Geomorphology - Geologic study of the shape and evolution of land forms.

Groundwater - Water found beneath the earth's surface that fills pores between materials such as

sand, clay or gravel. In aquifers, groundwater occurs in sufficient quantities that it can be used for drinking water, irrigation and other purposes.

Regulatory Limits - Standards set to ensure that water is safe for drinking and other uses. For surface water, the regulatory limits are the ADEQ surface water quality standards. For groundwater, the regulatory limits are the ADEQ aquifer water quality standards. Public drinking water supplies must not exceed the maximum contaminant levels established by the Safe Drinking Water Act. For soils, Arizona has established risk-based soil remediation standards applicable to soil remediation activities.

Remedial Investigation (RI) - An in-depth study designed to gather the data necessary to determine the nature and extent of contamination at a site and the risk posed by the contamination.

Remediation - Actions that deal with the release or threat of a release of a hazardous substance that could affect people or the environment. The term "cleanup" is sometimes used interchangeably with the terms remedial actions, removal actions, response action, remedy, remediation or corrective action.

Tailings - The waste from the milling of ores. Tailings are usually fine-grained and often contain hazardous substances in excess of regulatory limits.